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AF/3623 $

PATENT APPLICATION

ATTORNEY DOCKET NO. 10001529-1

ORIGINAL

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Dirk M. BEYER et al.	**Confirmation No.:**	3159
Application No.:	09/626,191	**Examiner:**	B. Van Doren
Filing Date:	07/28/2000	**Group Art Unit:**	3623
Title:	PROFILE-BASED PRODUCT DEMAND FORECASTING		

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith in **triplicate** is the Appeal Brief in this application with respect to the Notice of Appeal filed on **03/03/2004**.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $330.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$110.00
( )	two months	$420.00
( )	three months	$950.00
( )	four months	$1480.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of **$330.00**. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

(X) I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450. Date of Deposit: **05/03/2004**

OR

( ) I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number_____ on _____

Number of pages:

Typed Name: **Christina L. Paz**

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Respectfully submitted,

Dirk M. BEYER et al.

By _____

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ORIGINAL

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Dirk M. BEYER et al.	§	Confirmation No.:	3159
Serial No.:	09/626,191	§	Group Art Unit:	3623
Filed:	07/28/2000	§	Examiner:	B. Van Doren
For:	Profile-Based Product Demand Forecasting	§	Docket No.:	10001529-1

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Date: May 3, 2004

Sir:

Appellant hereby submits this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed on March 3, 2004.

I. REAL PARTY IN INTEREST

The real party in interest is the Hewlett-Packard Company, an assignment to the Hewlett-Packard Company was recorded on October 10, 2000, Reel/Frame 011199/0144.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related appeals or interferences.

III. STATUS OF THE CLAIMS

Originally filed claims:	1-15.
Claim cancellations:	6, 7, 11 and 14.
Added claims:	None.
Presently pending claims:	1-5, 8-10, 12-13 and 15.
Presently appealed claims:	1-5, 8-10, 12-13 and 15.

IV. STATUS OF THE AMENDMENTS

Applicants did not file any amendments after the final rejection.

V. SUMMARY

As technology advances, more and more new products are being introduced to replace older or technologically obsolete products. This tends to shorten the product life-cycle of products that are on the market and influences the profitability of technology-based products. Profitability can be improved if an accurate prediction of future demand is made. An over-prediction or under-prediction of actual demand may result in reduced profit. Disclosure page 1.

In accordance with at least one embodiment described in the disclosure at least from page 7, line 3, through page 13, line 6 and in conjunction with Figures 1, 3 and 4, Applicants' contribution comprises a system 10 that predicts a demand profile of a new product by averaging and normalizing demand profiles of similar products. Using the demand profiles of the similar products, the system 10 determines a total life-cycle demand for the new product by calculating an average demand per time period of each of the similar products, associating each average demand per time period with a date that represents a midpoint of the life-cycle of each similar product, and calculating an estimate of the average demand per time period at the date of the midpoint of the life-cycle of the new product.

Claim 1 exemplifies at least one embodiment of the invention and is as follows:

1. A product demand forecasting system, comprising:

a profile extractor that generates a demand profile of a new product yet to be introduced based on demand profiles of similar products already introduced, wherein the profile extractor normalizes and averages the demand profiles of the similar products to obtain the demand profile of the new product;

a life-cycle demand predictor that generates a total life-cycle demand of the new product based on historical demand data of the similar products;

a forecast creator coupled to the profile extractor and the demand predictor to generate a life-cycle demand forecast for the new product based on the demand profile and total life-cycle demand of the new product; and

a future demand extrapolation module coupled to the forecast creator to extrapolate the total life-cycle demand of the new product by calculating an

average demand per time period of each of the similar products, associating each average demand per time period with a date that represents a midpoint of the life-cycle of each similar product, and calculating an estimate of the average demand per time period at the date of the midpoint of the life-cycle of the new product.

VI. ISSUE

Whether claims 1-5, 8-10, 12-13 and 15 are patentable over 35 U.S.C. § 103 in view of the combination of: (1) Technology Strategy, Inc., website screenshots (reference A); (2) the article "Looking Back to Fashion's Future" by Ackerman (reference B); and (3) the article "Merchants Try Complex Math Tools to Improve Inventory Decisions" by Koloszyc (reference C).

VII. GROUPING OF CLAIMS

Claims 1-5 and 8-9 may be grouped together as well as claims 10, 12-13 and 15. Applicants have selected claim 1 from the first group (1-5 and 8-9) and claim 10 in the second group (10, 12-13 and 15) in the arguments below.

VIII. ARGUMENT

A. Reference A

The reference A teaches that Technology Strategy, Inc. (TSI), uses data mining, mathematical modeling, genetic optimization, and Monte Carlo simulation to develop analytical engines for forecasting sales and inventory requirements. The reference A further teaches that the analytical engines are designed to forecast short-cycle non-linear behavior (*e.g.,* the behavior of fashion merchandise). The analytical engines are used to optimize the timing and depth of markdowns, the allocation of inventory to stores, and the amount of inventory to maximize gross profits (see reference A's "Solutions" and "About TSI" screenshots).

B. Reference B

The reference B teaches that TSI offers a computer analysis of past selling history within a chain of stores. Further, reference B teaches that TSI provides custom analysis of historic sales patterns to develop forecasts of the sizes and colors that may be needed in individual stores at various times of the year (see reference B, page 2, paragraph 8, and page 3, paragraph 5).

C. Reference C

The reference C teaches that TSI analyzes historic data and creates a statistically derived forecast of future demand. Reference C also teaches that TSI follows a process of analysis and mathematical modeling, forecasting, simulation, and optimization to address large scale merchandising and inventory problems. (see reference C, paragraphs 2 and 3).

D. The Examiner Erred in Rejecting Claim 1 as Obvious in view of the TSI References (*i.e.*, references A, B and C)

Claim 1 is directed to a product demand forecasting system having, among other features, "[a] profile extractor [that] normalizes and averages the demand profiles of the similar products to obtain the demand profile of the new product" and "a future demand extrapolation module...to extrapolate the total life-cycle demand of the new product by calculating an average demand per time period of each of the similar products, associating each average demand per time period with a date that represents a midpoint of the life-cycle of each similar product, and calculating an estimate of the average demand per time period at the date of the midpoint of the life-cycle of the new product." The TSI references do not teach or suggest these limitations.

The Examiner admits that the references do not specifically teach "normalizing and averaging demand profiles" as required in claim 1 (see Final Office Action, page 5, paragraph 2). Furthermore, the Examiner admits that the references do not specifically teach associating "[an] average per time period with a date that represents a midpoint of [a] life-cycle" as required in claim 1 (see Advisory Action page 4, paragraph 1). The Examiner incorrectly asserts that these features and all of the claimed features would have been obvious in view of the TSI references, which make broad statements related to planning fashion merchandise sales and inventory using data mining, mathematical modeling, statistical analysis, genetic (multi-variable) optimization, and Monte Carlo simulation. Specifically, the TSI references refer to several products offered by TSI called "Pricing for Profit," "Gross Profit," "Merchandise Plan Evaluation," "Gross Margin," "Product Life Cycle," and "Volume-Price Endgame."

The Pricing for Profit product is described as using "custom mathematical models to help clients determine the optimal timing and depth of price changes that will maximize gross margin" (see reference A, screenshot with "Revolutionizing...to Maximize Gross Profit" heading, paragraph 1). The Gross Profit product is described as "optimization solutions that help retailers make optimal inventory investment and allocation decisions to further increase gross margin dollars and merchandise productivity while minimizing inventory investment risk" (see reference A, screenshot with "Revolutionizing...to Maximize Gross Profit" heading, paragraph 2). The Merchandise Plan Evaluation product is described as a "model" that provides "a statistically derived forecast" based on "historic data." The forecast is compared to a customer's "merchandise plan" to "highlight the risks or the errors" in the "merchandise plan" (see reference C, page 1, last paragraph).

The Gross Margin product is described as a "model" that "takes historical sales data to analyze different pricing strategies, giving the probability of reaching the targeted gross margin. [It uses] a method called Monte Carlo simulation, which is, in essence, a way to get the computer to run thousands of variations of different strategies very quickly so [the customer] can see the likely outcome" (see reference C, page 2, paragraph 7 and 8). The Product Life Cycle product is described as a "model" that is used for forecasting fashion or new products that have no sales history (see reference C, page 2, last paragraph). The Volume-Price Endgame product is described as being "built on the Product Life Cycle model and helps retailers determine inventory reduction strategies" (see reference C, page 2, last paragraph).

Other statements that describe the products and services of TSI, include "TSI utilizes advanced statistical modeling techniques that are not typically employed in large-scale merchandising information planning systems, general-purpose decision support tools, or data mining tools. [TSI's] approach leverages innovations more commonly applied in disciplines such as financial security options pricing, portfolio management, infectious disease modeling, and airline seat price optimization" (see reference A, "Solutions" screenshot, page 2).

In summary, the TSI references cited by the Examiner do not specifically teach or suggest the above described features of claim 1 and do not clearly state how the forecasting, inventory calculation, and pricing provided by TSI is accomplished other than brief statements such as those cited above. At most, the TSI references teach an inventory and pricing forecast system that does not include the features of Applicants' claimed invention and functions in a manner that is significantly different from Applicants' claimed invention.

In rejecting the "normalizing and averaging demand profiles" feature of claim 1 as obvious, the Examiner asserts that it is old and well known that simulations, such as Monte Carlo simulations, normalize and average historical data to generate values for uncertain future situations. For several reasons, Applicants respectfully disagree. First, the TSI references only briefly mention Monte Carlo simulations and multi-variable simulations (presumably the same). The reference C describes Monte Carlo simulation as "a way to get the computer to run thousands of variations of different strategies very quickly so you can see the likely outcome" (see reference C, page 2, paragraph 8). The references A and B do not clearly provide detail related to Monte Carlo simulation, but instead describe multi-variable simulations and calculations that determine which combination of factors such as total inventory, time of year, store location, sizes, colors, prices, and markdowns provide the largest profit margin (see reference A, "Solutions" screenshot, paragraph 3, and reference B, page 3, paragraphs 5 and 6).

Applicants submit that as described by the TSI references, Monte Carlo simulations (or equivalent) do not teach or suggest the "normalizing and averaging demand profiles" feature of claim 1 as suggested by the Examiner. Rather, Monte Carlo simulation (or equivalent), as described in the TSI references apply different combinations of variables to a problem (presumably described by an equation) to determine which combination provides the largest profit margin. This is consistent with other sources that describe Monte Carlo simulation (or equivalent). As explained in the Decisioneering reference (see Attachment of Applicants' Response to Final Office Action), Monte Carlo

simulation "randomly generates values for uncertain variables over and over to simulate a model." Also, as shown in the iDecide reference (see Attachment of Applicants' Response to Final Office Action), "Monte Carlo modeling takes randomly selected values of every node in [a] model and uses them in combination with each other until a statistically accurate representation of all possible combinations has been created." Neither the TSI references, the Decisioneering reference, nor the iDecide reference teaches or suggests that normalizing and averaging is associated with simulations such as Monte Carlo simulations.

On the contrary, Applicants submit that "normalizing and averaging" as required in claim 1 is detrimental to the purpose of Monte Carlo simulation (or equivalent) which is used to show all possible combinations of randomly generated variables. Specifically, by averaging all the possible combinations, the user is no longer able to see which combination of random variables actually produces the best result. In summary, Applicants respectfully submit that the Examiner incorrectly asserted that simulations, such as Monte Carlo simulations, are inherently associated with normalizing and averaging. In particular, averaging is detrimental to the purpose of the Monte Carlo simulations (or equivalent) and would prevent TSI from discovering the optimal combination of variables to produce a maximum profit.

Furthermore, the selling cycle for clothing (on which the TSI references are based) is known and predetermined. Therefore, there is no need to "normalize and average demand profiles" as is required in claim 1. The TSI references refer to "seasons" to describe the time period during which merchandise is sold. For example, the reference A uses the language "during the season" (see reference A, "Solutions" screenshot, last paragraph). The reference B uses the language "the new season's styles," "drastic end-of-season price cuts," "when last spring's lines came out," and "to review next spring's merchandising plans" (see reference B, page 1, paragraphs 1, 3 and 6). The reference C uses the language "plans for spring 1999," "as seasons roll by," "very early in the season," and "product season" (see reference C, page 1, paragraph 6, page 2, paragraph 11, page 3,

paragraphs 2 and 4). Applicants submit that the TSI references do not teach or suggest the "normalizing" feature of claim 1 as suggested by the Examiner, at least in part, because seasonal products have a known and predetermined life-cycle and thus need not be normalized. At any rate, the TSI references do not ever mention or suggest normalizing or averaging data.

The Examiner asserts that the "associating [an] average demand per time period with a date that represents a midpoint of [a] life-cycle" feature of claim 1 is obvious because the TSI references mention product life-cycle curves and show small graph icons having axes, lines and marks (see reference C, page 1, paragraph 2, and reference A, "Solutions" screenshot). The Examiner's argument also appears to be based on the TSI references mentioning that markdown dates are forecast and adjusted during the season (see reference B, page 2, paragraphs 4 and 5, and Advisory Action, page 4, paragraph 1). However, the TSI references do not provide any explanation of the graph icons' significance nor do the TSI references suggest a motivation for Applicants' claimed feature.

The Examiner seems to argue that one of ordinary skill in the art would be motivated to modify the TSI references with the claimed "mid-point" feature to enable the TSI system to more accurately predict the timing of markdowns (see Advisory Action, page 4, paragraph 1). Applicants respectfully disagree and submit that the TSI system would not benefit from the claimed "mid-point" feature as stated by the Examiner because calculating a single mid-point rather than multiple points decreases accuracy in favor of simplicity. At the very least, Applicants submit that the usefulness of combining the TSI system with the claimed features is doubtful and unknown because the systems clearly implement different techniques to forecast product life-cycles. As previously mentioned, the TSI references claim that "TSI utilizes advanced statistical modeling techniques that are not typically employed in large-scale merchandising information planning systems, general-purpose decision support tools, or data mining tools. [TSI's] approach leverages innovations more commonly applied in disciplines such as financial security options pricing, portfolio management, infectious disease

modeling, and airline seat price optimization" (see reference A, "Solutions" screenshot, page 2).

The obviousness rejection of Applicants' claimed invention is improper, at least, under MPEP 2141.02 ("Prior Art Must Be Considered In Its Entirety, Including Disclosures That Teach Away From The Claims") and MPEP 2143.01 ("The Proposed Modification Cannot Render The Prior Art Unsatisfactory For Its Intended Purpose" and "The Proposed Modification Cannot Change The Principle Of Operation Of A Reference"). For at least the reasons provided above, individually or in combination, the Examiner erred in rejecting claim 1.

E. The Examiner Erred in Rejecting Claim 10 as Obvious in view of the TSI References (*i.e.*, references A, B and C)

Claim 10 is directed to a method of providing life-cycle product demand forecasting that comprises, among other features, "normalizing and averaging the demand profiles of the similar products to obtain a demand profile of the new product" and "calculating an average demand per time period of each of the similar products, associating each average demand per time period with a date that represents the midpoint of the life-cycle of each product, and using the average demand profile per time period at the midpoint of the life-cycle of each similar product to calculate an estimate of the average demand per time period at a midpoint of the life-cycle of the new product."

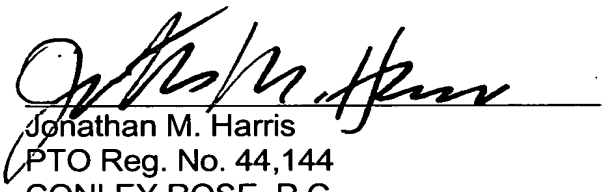
For, at least, the reasons described previously, with respect to claim 1, the TSI references do not teach or suggest "normalizing and averaging the demand profiles of similar products" nor "using the average demand profile per time period at the midpoint of the life-cycle of each similar product to calculate an estimate of the average demand per time period at a midpoint of the life-cycle of the new product" as required in claim 10." The obviousness rejection of Applicants' claimed invention is improper, at least, under MPEP 2141.02 ("Prior Art Must Be Considered In Its Entirety, Including Disclosures That Teach Away From The Claims") and MPEP 2143.01 ("The Proposed Modification Cannot Render The Prior Art Unsatisfactory For Its Intended Purpose" and "The Proposed Modification Cannot Change The Principle Of Operation Of A Reference"). For at

least the reasons provided above, individually or in combination, the Examiner erred in rejecting claim 10.

IX. CONCLUSION

For the reasons stated above, Applicants respectfully submit that the Examiner erred in rejecting all pending claims. If any fees or time extensions are inadvertently omitted or if any fees have been overpaid, please appropriately charge or credit those fees to Hewlett-Packard Company Deposit Account Number 08-2025 and enter any time extension(s) necessary to prevent this case from being abandoned.

Respectfully submitted,



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APPENDIX TO APPEAL BRIEF

CURRENT CLAIMS

1. (Previously presented) A product demand forecasting system, comprising

a profile extractor that generates a demand profile of a new product yet to be introduced based on demand profiles of similar products already introduced, wherein the profile extractor normalizes and averages the demand profiles of the similar products to obtain the demand profile of the new product;

a life-cycle demand predictor that generates a total life-cycle demand of the new product based on historical demand data of the similar products;

a forecast creator coupled to the profile extractor and the demand predictor to generate a life-cycle demand forecast for the new product based on the demand profile and total life-cycle demand of the new product; and

a future demand extrapolation module coupled to the forecast creator to extrapolate the total life-cycle demand of the new product by calculating an average demand per time period of each of the similar products, associating each average demand per time period with a date that represents a midpoint of the life-cycle of each similar product, and calculating an estimate of the average demand per time period at the date of the midpoint of the life-cycle of the new product.

2. (Previously presented) The product demand forecasting system of claim 1, wherein the profile extractor further comprises

a relevant product selection module that selects the similar products and extracts the historical demand data of the similar products from an external historical demand database; and

a demand normalization and average profile determination module that calculates and normalizes the demand profile of each of the similar product, and averages all the normalized demand profiles to obtain the demand profile of the new product.

3. (Previously presented) The product demand forecasting system of claim 2, wherein the demand normalization and average profile determination module

normalizes the demand profiles of the similar products for lengths of life and total life-cycle demands.

4. (Previously presented) The product demand forecasting system of claim 2, wherein the demand normalization and average profile determination module averages the normalized demand profiles by

discretizing each profile at a pre-specified number of equidistant points between the beginning and end of the life-cycle of each demand profile; and

calculating an empirical mean and an empirical standard deviation of the demand profiles of the similar products at the equidistant points to yield an averaged demand profile as the demand profile of the new product.

5. (Original) The product demand forecasting system of claim 4, wherein the demand normalization and average profile determination module also estimates variance information of the normalized and averaged demand profiles.

6. (Canceled).

7. (Canceled).

8. (Original) The product demand forecasting system of claim 1, further comprising an updating module that provides a revised new total life-cycle demand estimate using (1) the total life-cycle demand of the similar product, (2) the demand profile of the new product, and (3) past demand information, when available, of the new product.

9. (Original) The product demand forecasting system of claim 8, wherein the forecast creator is also coupled to the updating module such that if the forecast creator receives the revised new total life-cycle demand estimate, the forecast creator uses the revised new total life-cycle demand estimate instead of the total

life-cycle demand from the life-cycle demand predictor to calculate the life-cycle demand forecast.

10. (Previously presented) A method of providing a life-cycle product demand forecast for a new product yet to be introduced, comprising

collecting historical demand data of similar products of the new product, wherein the similar products have already been introduced;

generating demand profiles of the similar products based on the historical data of the similar products;

normalizing and averaging the demand profiles of the similar products to obtain a demand profile of the new product;

generating a total life-cycle demand of the new product based on the historical demand data of the similar products; and

generating the life-cycle product demand forecast for the new product based on the demand profile and total life-cycle demand of the new product;

wherein generating the total life-cycle demand of the new product comprises calculating an average demand per time period of each of the similar products, associating each average demand per time period with a date that represents the midpoint of the life-cycle of each product, and using the average demand profile per time period at the midpoint of the life-cycle of each similar product to calculate an estimate of the average demand per time period at a midpoint of the life-cycle of the new product.

11. (Canceled).

12. (Previously presented) The method of claim 10, wherein normalizing and averaging the demand profiles averages all the normalized demand profiles by

discretizing each profile at a pre-specified number of equidistant points between the beginning and end of the life-cycle;

calculating an empirical mean and an empirical standard deviation of all the profiles at the equidistant points to yield an averaged demand profile as the demand profile of the new product.

13. (Previously presented) The method of claim 10, wherein normalizing and averaging the demand profiles further comprise estimating variance information of the normalized and averaged demand profiles.

14. (Canceled).

15. (Original) The method of claim 10, further comprising

determining if past demand information of the new product is available;

if the past demand information of the new product is available, then providing a revised new total life-cycle demand estimate using (1) the total life-cycle demand of the similar product, (2) the demand profile of the new product, and (3) the past demand information of the new product.